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ABSTRACT

This discussion of the use of citation frequency data in judging a cluster or an entire collection of journals in academic libraries discusses the rationale for this methodology, and illustrates its application by examining citation counts in ISI's Journal Citation Reports (JCR) for periodicals in the area of communication research. The comparative merits of citation data and use/demand data are discussed, and it is concluded that citation frequency data are of more potential value to smaller academic libraries in evaluating their entire collection, and to larger libraries in evaluating sectors of journals and in storage decisions. Footnotes, three tables of data, and a list of 25 references are attached. (RAA)

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THE JOURNAL CITATION REPORTS AS A TOOL IN PERIODICAL SUBSCRIPTION DECISIONS: AN ILLUSTRATION AND AN EVALUATION

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The Journal Citation Reports as a Tool in Periodical Subscription Decisions: An Illustration and an Evaluation

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The recent Report of the National Enquiry on Scholarly Communication (1979) addresses the financial dilemmas facing both scholarly journals and academic libraries. College and university librarians need no reminder of the latter siutation. Tieing the two concerns together, we can ask, "How can academic libraries optimally spend increasingly limited budgets amid a sea of proliferating journal titles and rising prices?" (ibid., pp. 9-13). Even if libraries increase the proportion of their acquisition budgets for periodicals, they will still need to exercise restraint inasmuch as price hikes in institutional rates of journals are outpacing those for books.[1] More and more, cancellation of titles is a sensitive choice to be faced. Thus, the Enquiry recommends careful selection and 'deselection' (ibid., pp 21-22). To determine the journals essential for its curricula and faculty, college/university libraries need measures of merit that are objective, simple to compute, and (not least) that their librarians can trust and defend. Inertia or special interests are now luxuries in subscription decisions.

The purpose of this paper is to illustrate and to evaluate 'citation frequency data' in judging a cluster or an entire collection of journals. Such data is now furnished by the ISI's Journal Citation Reports (JCR). These annual reports began in 1975 for Science journals and for Social

Science journals in 1977. The JCR can cautiously inform the processes of selection, retention, cancellation, storage, or discarding of scholarly journals. Garfield (1972a; 1972b) has insistently championed this idea as founder and President of the Institute for Scientific Information, Inc. Reports of the application of this tool to clusters of scientific journals for these purposes are now common (e.g., Singleton, 1976; Cawkwell, 1978; Hirst, 1978).[2]

The rationale underlying citation analysis is simple enough. References made to an author, an article, or to a journal are not distributed equally or randomly.[3] Scholarly (especially scientific) journals whose articles are rarely cited within five to ten years of their publication are manifestly of less interest or influence than are more frequently cited pieces (Price, 1963; 1965; 1970). To be sure, reference to an author's article (and, in effect, to its vehicle, a journal) is not a mere function ot its 'merit'; references serve many possible purposes. Weinstock (1971) listed fifteen reasons that could impel a writer to refer to another's work; Martyn (1975) and Gilbert (1977) each listed more.[4] Thus, the meaning of a citation count for a journal is open to debate and has indeed spawned some controversy. Among librarians, the relationship of citation frequency to frequency of library use for journals has been the major issue, at least in Great Britain. Line (1978) in fact argues that citation analysis is of no value to library operations and that local use or demand is the only criterion of use that should concern a library. As to a correlation between use and citation among journals, we all know that some journals are read but rarely cited and that some highly cited journals may not receive nigh library

use (e.g., a journal that most researchers in a field receive as a benefit of membership in an association will be widely read but library use may be relatively low). Satariano (1978) found this pattern among Sociology journals. Thus, citation and local use must be viewed as separate indicators of the value of journals, neither of which safely predicts the other. Many pitfalls lurk in the mechanics of citation analysis (such as how journal 'self-citations' are to be counted), but they will not be reviewed here. Despite these provisos, Garfield mounts a strong case for linking citation frequency (especially when expressed as a rate per article published) to a journal's impact or influence upon specialists in a field. One major drawback of any technique of citation analysis is that none can be used to judge the value of newly begun journals. Use measures suffer the same deficiency, however. With the appearance of the JCR, citation counts for over 3400 science journals and over 1200 social science journals are now (1978) available.

To illustrate use of the JCR, I will examine citations to journals in a multi-disciplinary area loosely called "Communication Research." Academic interest in this behavioral focus has burgeoned in the past two decades[5] but connections between its various specialties (e.g., psycholinguistics, speech communication, mass media research, etc.) have not been traced via analysis of citations in their respective journals. Preliminary data (Parker, Paisly, and Garrett, 1967; Leavy, unpublished) suggest that the reference patterns in empirically-oriented human communication journals are more akin to those in science journals than to those in humanities

journals, i.e., bibliographic references are more recent, more numerous, and proportionally more to journal than to monographic literature (see also Garfield, 1979a). However, it is the citations received by these journals as recorded by the Social Sciences Citation Index that will be the focus here.

Initially, twenty journals were identified by prior research (Parker et al, 1967) and by Speech Communication faculty at Wichita State University as relevant. Social Psychology journals were winnowed from this list because, while admittedly an important source of such articles, they do not concentrate on human communication processes and therefore should not be judged in terms of that emphasis. Also, only journals indexed by SSCI and included in the JCR analyses could be inspected.[6] These limitations reduced the list to seven communication research journals and two related psychology journals. These are named in Table 1. Inasmuch as my purpose here is to illustrate a technique, the brevity of the list is not a crucial drawback. Speech/communication journals that JCR ideally could have included are listed in an Appendix, however.

The JCR is divided into three major sections: a Journal Ranking Package, a Citing Journal Package, and a Cited Journal Package. The sheer number of citations received by these journals in 1977 and 1978 is found in the Journal Ranking Package. These totals are reported in Table 1, Column B. The median number of citations received by the 1200+ SSCI journals in 1977-1978 was 159; only two of the nine journals fall below the median. The proportion of total citations which were references to articles each journal had published

in the prior ten years was then calculated from the Cited Journal Package of JCR. These percentages are shown in Column C of this Table. On its face, the counts in Column B are biased toward journals with larger back-files of articles, but the percentages in Column C are meant to temper that skew somewhat.[7] Still, sheer citation counts do no justice to young journals - witness Communication Research. The effects of widely unequal pools of citable articles can be controlled by what Garfield (passim) has called an "impact factor." A journal's "impact factor" is a guage of its recent influence. For any given year, it is the number of citations received to articles it has published in the prior two years and it is expressed as a per article average. Column D of Table 1 reports this impact in 1977 and 1978, respectively, for the nine journals as derived from the Journal Ranking Packages of JCR. The higher the number, the more currently influential the journal. For example, the Quarterly Journal of Speech had the highest impact of the seven Speech/Communication journals in 1977-1978. The median impact factors are reported to serve as crude benchmarks. The fluctuation between the two years for most of the journals should warn us that a longer series of annual reports (as are available in the JCR for SCI) is needed to reveal a pattern. Nevertheless, we can safely infer differences in impact between some journals in this set. All else equal, less influential journals (e.g., Central States Speech Journal, Journal of Communication and Journal of Psycholinguistic Research) require local use or demand more than do more influential journals on the list to justify their ordering or retention. The relative costs of the journals must also be considered, of course, in these comparisons; 1980 subscription

prices are given in Column E. As an example, the Journal of Verbal Learning seems to be a better value than the Journal of Psycholinguistic Research in terms of price, impact (perhaps the best predictor of potential demand), and total citation.

Table 2 indicates the sources of citations for the seven Speech/Communication journals as revealed by the JCR's Cited Journal Package. For all three Speech journals, the most frequent source of citation was self-citation (first) and the other journals in that set. In fact, for Central States Speech Journal and Quarterly Journal of Speech, these sources provided the majority of their citation. Self-citation is the single most common source of citations for each one of the four communication journals also (this is true of a majority of all journals). Otherwise, citing sources appear more widely scattered than for the Speech journals examined, particularly so for Public Opinion Quarterly and the Journal of Communication. Communication journals apparently rely on a more inter-disciplinary foundation than do Speech journals. Very little flow of citation between the two sets of journals was found relative to the flow of citation (influence) within the sets.[8]

In judging where these results lead us, I must reemphasize that use/demand data and citation data are distinct considerations in decision-making. Ideally, only the least used and least cited journals should be at risk in an academic library. For journals that fit curricular or research areas of a university, high use or high citation alone justify on-site availability

of titles when library space and budgets permit. As "push comes to shove", however, local use or demand will no doubt overrule high citation as a principle of selection, retention, and 'deselection' in those instances where big differences exist in citation and use/demand level for a journal (Rafsnider, 1975).

The choice of Speech/Communication journals to illustrate the value of citation analysis (and that was the primary purpose of the choice) was not fortunate for at least two reasons. First, the number of such journals indexed in the SSCI and its JCR was too small to give an optimal picture of the procedure. Second, the prices of these journals are in the low range and the dollar differences may seem inconsequential, at least not warranting detailed evaluation (the two psychology journals checked cost more than the other seven journals combined). Journals in most areas of the social sciences are only a little more expensive but an illustration from Sociology or Anthropology would have furnished a larger set from which to compare citation figures.

These considerations lead me to two strategic conclusions. The JCR is of more potential value to smaller academic libraries in evaluating their entire periodical collection and to larger libraries in evaluating sectors of journals and in storage decisions. One rank-order of journals in the JCR is by citation count and another a descending array by impact factor. Thus, the lowest quartile level of citation and of impact, respectively, can be quickly determined and those journals that fall beneath that level

on both quickly identified.[9] These journals would be candidates for cancellation or nonacquisition. Conversely, those titles above a pre-set rank of citation and impact would be candidates for retention or ordering. Budgetary limits would limit the use of such a technique in assessing the periodical collection. As for storage, journals held that have long runs can be inspected to discover the percentage of present citation to their backfiles of articles published since a pre-determined date (as in Table 1, Column C). This information, coupled with use patterns for these journals, could assist in remote storage decisions. Qualifications surround the application of citation data to any collection development decision in the academic library.

Some final observations on access to, and the use of, the JCR seem to be in order. The annual JCR volumes can not be purchased from ISI apart from subscription to the SCI and/or SSCI. These systems are expensive - $1170 for the SSCI in 1981 - and no library would justify a subscription to either SCI or SSCI solely to obtain its JCR. Inter-library loan is one answer to that problem; on-line search of SCI/SSCI for journal citations is not possible. Utilization of the JCR requires orientation and proper interpertation of its many sections is a professional task. Its instructions are clear. The validity of its data is at points open to question: witness the citation data for Communication Monographs which is in doubt due to a title change from Speech Monographs. Still, the herculean effort in computer-generating this assemblage of data is unprecedented and it is my view that judicious use of the data can benefit any academic library in managing its scholarly periodical collection.

FOOTNOTES

1
The average price of hardcover books rose from $14.09 in 1974 to $20.10 in 1978 (a 43% hike); in the same period, the average periodical rose from $17.71 to $27.58 (a 58% hike). See Bowker Annual of Library and Book Trade Information. New York: Bowker, 1979, pp. 334-335. The September 1 and October 15, 1979 issues of Library Journal give a more detailed picture of periodical prices. It should be mentioned that subscription costs are only part of the total costs in serial management for libraries. Ordering, claiming, binding, and storing costs are all rising.

2
For the most complete bibliographies in this specific area, see Eugene Garfield (1979a, pp. 233-239, and 1979b, pp. 59a-65a). For an excellent review article and bibliography that focuses on citation analysis in a larger context, see Line and Sandison (1974).

3
I will use the distinction introduced by de Solla Price (1970). A 'reference' is made by an author to an earlier document or report; the document receives the 'citation'. In other words, the 'reference' acknowledges, the 'citation' is acknowledged. While references and citations are two sides of the same coin, it is helpful to maintain the distinction. Like Garfield, however, I will use "citation analysis" in talking about either focus. Garfield is aware of the distinction but he talks about 'cited journals' and 'citing (sic) journals.'

4
For example, paying homage to a mentor, negative criticism, "padding", and invoking certain classic papers in an attempt to persuade readers by authority to the writer's point of view, all these (and more) are possible reasons, none of which demonstrates "merit."

5
This assertion can be supported in many ways, e.g., by viewing the growth of graduate degree programs in the area, the number of scholars whose major lines of interest center on communication processes, and the number of journals and indexing/abstracting services begun in this period. Language and Language Behavior Abstracts and Communication Abstracts each began in the 1970's and each indexed over 200 journals in 1979.

6
For some unknown but annoying reason, some journals regularly indexed by SSCI are not included in the Citing or Citing Journal Packages of JCR. Communication Education (once The Speech Teacher) is one such example.

7

As we can all intuit, journals differ widely in their bulk. Wood and Ferguson (1974) found that the bulkiest 10% of social science journals (those with the most articles per volume) in a recent year contained 45% of all of the articles. This only highlights the need for a "per article" citation rate.

8

Reference patterns in these nine journals were briefly examined in the Citing Journal Package of JCR. I did this in part to identify other highly cited journals not analyzed as source journals by JCR and in part to map the flow of influence between journals in more detail. References made in journals have been the usual source of information analyzed to either confirm (e.g., Hamelman and Mazze, 1972) or to determine (e.g., Hirst, 1978) the "core journals" in a field. Hirst's iterative idea and device of identifying such journals is sound but his formula seems invalid to this writer. The citation flow between journals in a broad field is primarily of bibliometric interest (see Narin, 1976; Arms and Arms, 1977) but can reveal to librarians the relative isolation or interdependence of disciplines. For example, if "core" speech journals refer prominently to communication or psycholinguistic journals, then a stronger case can be made for a school with a Master's Program in Speech Communication to have communication journals accessible on-site than if citation flow is low. The data here suggest that it is low. Detailed reference analysis was thwarted here, however, because references in most of the nine journals were so widely dispersed that less than one-half of all references were even pinpointed. The Journal of Communication, for example, made 1075 references in its articles to 724 different journals in 1977-1978. Such scatter is not unusual. The only impression gained from the reference analysis that can be reported with some confidence is that communication journal articles refer more to social psychology sources than do articles in speech journals.

9

The lowest quartile of journals receiving citation in 1977 and 1978 received 27 or fewer citations in each year; the lowest quartile of journals in impact had impact factors of .14 or less in each year. Only 166 of the SSCI journals had impact factors of 1.00 or higher in 1977 and only 1970 did so in 1978.

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TABLE 1. SPEECH/COMMUNICATION JOURNALS ANALYZED IN SSCI JOURNAL CITATION REPORTS (1977-1978), INITIAL PUBLICATION DATE, TOTAL CITATIONS RECEIVED, PROPORTION OF CITATIONS TO PRIOR 10 YEAR BACKFILE, IMPACT FACTOR OF JOURNAL, AND 1980 INSTITUTIONAL PRICE.

	(A) DATE OF 1ST PUBLICATION	(B) TOTAL CITATIONS RECEIVED IN 1977-1978	(C) % CITATIONS TO 1968- ARTICLES	(D) IMPACT FACTOR 1977	1978	(E) 1980 PRICE
Central States Speech Journal	1941	94	78%	.11	.24	$15.00
Communication Monographs	(1934)	414	53%	.24	?*	$25.00
Quarterly Journal of Speech	1915	389	64%	2.36	1.81	$25.00
Communication Research	1974	137	100%	.70	.42	$28.00
Journal of Communication	1951	541	89%	.34	.52	$18.00
Journalism Quarterly	1924	1104	58%	.56	.28	$12.00
Public Opinion Quarterly	1937	2029	48%	1.17	.78	$25.00
Journal of Psycho-Linguistic Research	1971	245	100%	.62	.36	$95.00
Journal of Verbal Learning/Verbal Behavior	1962	4187	80%	1.98	2.58	$67.00
		MEDIAN FIGURE		MEDIAN IMPACT FACTOR		
All SSCI JCR Journals (N=1200+)		159		.31	.32	

*Not ascertainable in JCR for 1978.

TABLE 2. CITATION FREQUENCY AND PROPORTION FROM OTHER SPEECH OR OTHER COMMUNICATION JOURNALS TO EACH JOURNAL (1977-1978)

	# OF CITATIONS FROM OTHERS IN SET*	% OF TOTAL CITATION
SPEECH JOURNAL SET (N=3)		
Central States Speech Journal	63	67
Communication Monographs	161	39
Quarterly Journal of Speech	273	70
COMMUNICATION JOURNAL SET (N=4)		
Communication Research	68	50
Journal of Communication	151	28
Journalism Quarterly	606	55
Public Opinion Quarterly	346	17

*Communication Education was added to citing sources of the speech journals so as to render a fairer comparison of percentages between the two sets of journals.

APPENDIX

SPEECH/COMMUNICATION JOURNALS OF POTENTIAL INTEREST NOT ANALYZED IN JCR CITED JOURNAL PACKAGE

	DATE OF 1ST PUBLICATION	1980 INSTITUTIONAL PRICE
Communication Education (Today's Speech)	1952	$25.00
Communication Quarterly	1976	$13.00
Southern Speech Communication Journal	1935	$14.00
Western Journal of Speech Communication	1937	$35.00
Communications (Germany)	1975	$38.53
Human Communication Research	1974	$15.00
Journal of Applied Communication Research	1973	$ 6.00